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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/523,239	09/28/2005	Franz Schuler	10808/206	6476
48581 7590 06/17/2009 BRINKS HOFER GILSON & LIONE/INFINEON INFINEON PO BOX 10395 CHICAGO, IL 60610				
			EXAMINER SALERNO, SARAH KATE	
			ART UNIT 2814	PAPER NUMBER
			MAIL DATE 06/17/2009	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/523,239

Applicant(s)

SCHULER ET AL.

Examiner

SARAH K. SALERNO

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 April 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) 7-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/CDC)
- Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. Applicant's amendment/arguments filed on 4/14/09 as being acknowledged and entered. By this amendment no claims are canceled, no claims have been added claims 1-15 are pending and claims 7-14 are withdrawn.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-6 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (US PGPub 2002/0076879) in view of Kawai et al. (US Patent 5,675,173 of record).

Claim 1: Lee teaches a semiconductor component with trench isolation for defining active regions in a semiconductor substrate, the trench isolation comprising (FIG. 2):

a deep isolation trench with a first covering insulation layer (33) below a surface of the semiconductor substrate and a second covering insulation layer (35) over the first covering insulation layer and above the surface of the semiconductor substrate, a side wall insulation layer (20) and an electrically conductive filling layer (31), which is electrically connected to a predetermined doping region of the semiconductor substrate

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(10) in a bottom region of the isolation trench and wherein the first covering insulation layer is over a top surface of the electrically conductive filling layer; and

further comprising:

a trench contact which comprises: a deep contact trench with a side wall insulation layer (20) and an electrically conductive filling layer (31), which is electrically contact-connected to the predetermined doping region of the semiconductor substrate in a bottom region of the contact trench; a trench contact insulation layer (33) above a surface of the electrically conductive filling layer;

a contact opening in contact with the surface of the electrically conductive filling layer

wherein a composition of the electrically conductive filling layer that is electrically, contact-connected to the predetermined doping region of the semiconductor substrate in a bottom region of the contact trench is the same as a composition of the electrically conductive filling layer having a top surface in contact with the contact opening (FIG. 5; [0036])

Lee does not teach a contact opening through the trench contact insulation layer and in contact with the surface of the electrically conductive filling layer. Kawai teaches a contact opening (12) through the trench contact insulation layer and in contact with the surface of the electrically conductive filling layer to apply a potential to the substrate. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the device taught by Lee to have the trench

contact through the insulation layer so that a potential could be applied to the substrate (FIG. 2; Col. 2).

Claim 2: Lee teaches the first covering insulation layer (6) is within the isolation trench (FIG. 2).

Claim 3: Kawai teaches the trench isolation and the trench contact have a larger depth than an associated depletion zone in the semiconductor substrate (FIG. 2).

Claim 4: Lee teaches the trench isolation further comprises a widened, shallow isolation trench at a surface of the semiconductor substrate configured for filling non-active regions to trench (FIG. 2).

Claim 5: Lee teaches the predetermined doping region comprises a doping well comprising a multiple well structure trench (FIG. 2).

Claim 6: Lee teaches the semiconductor substrate comprises Si, the covering insulation layer and side wall insulation layer comprise SiO_2 , and the filling layer comprises highly doped polysilicon (Col. 2; [0026-0028]).

Claim 15: Kawai teaches a gate oxide layer (11) over a surface of the second covering insulation layer.

Response to Arguments

4. Applicant's arguments with respect to claims 1-6 and 15 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SARAH K. SALERNO whose telephone number is (571)270-1266. The examiner can normally be reached on M-R 8:00-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Wael M Fahmy/
Supervisory Patent Examiner, Art
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/S. K. S./
Examiner, Art Unit 2814